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A STUDY OF LOW-LEVEL RADIOACTIVE  
SOLID WASTE DISPOSAL AND STORAGE AREAS  
AT THE OAK RIDGE GASEOUS DIFFUSION PLANT

K-25 Technical Services Division

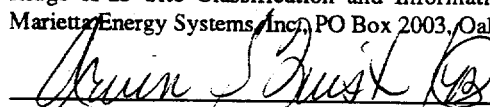
April 22, 1977

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OAK RIDGE, TENNESSEE

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Waste Disposal and Storage Areas at the ORGDP

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INTRODUCTION

The Oak Ridge Gaseous Diffusion Plant (ORGDP) is a complex of production, research, development, and supporting facilities distributed over a 640-acre area of eastern Tennessee. It's primary purpose is the enrichment of uranium hexafluoride ( $UF_6$ ) in the uranium-235 isotope, together with other interrelated nuclear energy functions and activities.

The waste management programs at ORGDP are involved with normal operations of certain process buildings. Most low-level radioactive waste comes from low-enriched or depleted uranium contaminated pieces of equipment, materials, and tools that are not decontaminated due to economic reasons; waste from the equipment decontamination process; waste from chemical trapping systems; and waste from the uranium recovery operation. A significant fraction of this waste is also produced by the development and analytical laboratories. The radioactive solid waste is similar to ordinary industrial trash, except that it may have been contaminated or is suspected of having been in contact with uranium materials.

This report will describe the low-level nuclear waste disposal and storage areas and the practices used in operating them at ORGDP. The main categories considered are physical site characteristics, description of facilities, and operating practices at these facilities.

The objectives of this study are: (1) to provide information on each burial site, (2) to describe burial ground procedures being followed, and (3) to denote any specific recommendations needed to ensure that low-level solid radioactive waste is effectively managed at ORGDP.

No high-level radioactive waste material is stored or disposed of at ORGDP. The vast majority of the low-level solid waste is material contaminated with uranium and with trace quantities of neptunium-237, plutonium-239, and technetium-99.

The source of the traces of transuranic isotopes and technetium-99 was the receipt of uranium oxide which was recovered from spent production reactor fuel. This oxide was subsequently converted to  $UF_6$  for feed to the diffusion plants.

There are five solid low-level radioactive waste sites at ORGDP: Old Classified Burial Ground, New Classified Burial Ground, K-33 Contaminated Waste Burial Ground, K-722 Scrap Metal Yard, and K-1407-C Retention Basin. Three of the five sites are land disposal burial grounds, but only one is still active. The fourth site is an active retention basin in which low-level radioactive waste contaminates the sludge in bottom sediments. The fifth site is an active storage area above ground where both noncontaminated and low-level radioactive contaminated scrap metal is stored. These site locations, as well as other pertinent areas of the plant, are depicted in Figure 1.

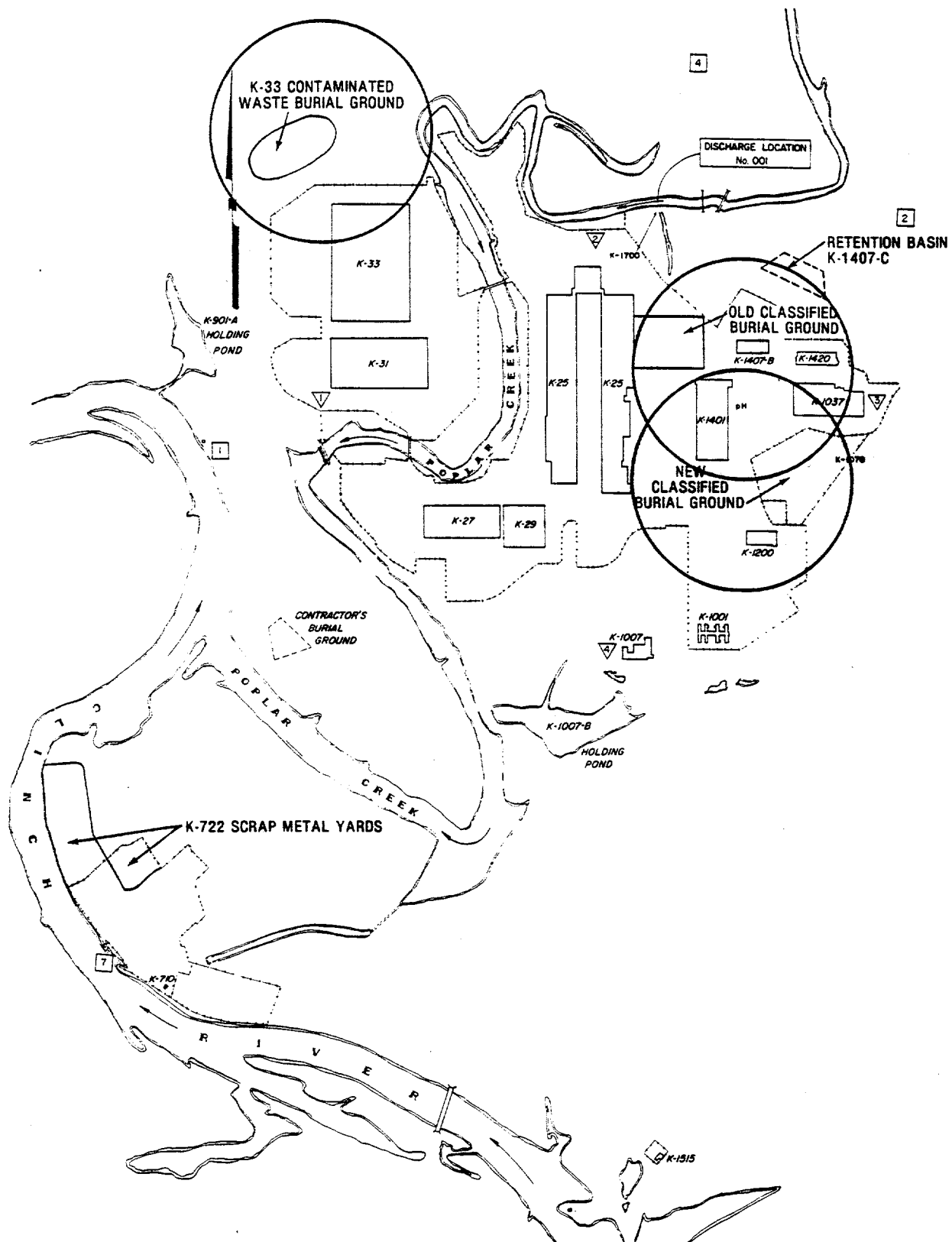


Figure 1  
ORGDP LOW-LEVEL SOLID RADIOACTIVE  
WASTE STORAGE AND DISPOSAL SITES

## TYPES OF MONITORING SYSTEMS

The monitoring systems employed by ORGDP vary, depending upon the characteristics of the waste disposal sites. The Old Classified Burial Ground (which is no longer utilized for waste disposal) lies in the drainage basin that discharges into Poplar Creek via ORGDP's National Pollutant Discharge Elimination System (NPDES) Location 001. Radionuclide (uranium, plutonium-239, neptunium-237, technetium-99, and cesium-137) monitoring of this effluent is effected by the monthly collection and analysis of 24-hour composite samples. Since this area was constructed over an existing swamp, the leaching of any material should be detectable in the 001 effluent. Therefore, no effort has been made to monitor subsurface waters in this area.

The New Classified Burial Ground is located on a hill approximately 800 ft above sea level and drains to Poplar Creek through NPDES Location 001 and through the K-1007-B holding pond. Both locations provide for the monthly collection and analysis of 24-hr composite samples. During FY 1978, test wells will be drilled in and around this site for the monitoring of subsurface waters.

The K-33 contaminated burial ground, which was closed in March 1976, lies within the drainage basin that empties into the K-901-A holding pond. Therefore, all surface drainage from this disposal area is monitored through the monthly sampling of the effluent from the K-901-A pond. The subsurface drainage from the K-33 burial ground is monitored through the periodic sampling of four shallow test wells located around the immediate perimeter of the site. However, due to the underlying geology of this site (cherty dolomite), there is a distinct possibility that any leached material would not be detected.

The only monitoring associated with the K-722 Scrap Metal Yard is that conducted on the Clinch River at locations approximately 1 and 5 miles below the site. As in the case of all of the ORGDP radioactive monitoring stations, these stations provide for the monthly collection of samples that are analyzed for all radionuclides associated with the operation of the plant.

The K-1407-C Retention Basin lies within the drainage basin that discharges into Poplar Creek via NPDES Location 001 (Figure 1). Radionuclide monitoring of this effluent is also effected by the monthly collection and analysis of 24-hr composite samples. No effort is now made to monitor the possible effect of the K-1407-C basin on subsurface water systems that might not discharge into Poplar Creek.

Other monitoring stations that could monitor loss of material from the ORGDP solid radioactive waste disposal sites include two locations on Poplar Creek where 24-hr composites are collected monthly.

## PHYSICAL SITE CHARACTERISTICS

## TOPOGRAPHY

The Oak Ridge Reservation lies in the valley and ridge subregion of the Appalachian Highlands Physiographic Province. Alternating ridges and valleys lie from the northern end of the Oak Ridge Reservation to the southern end. The altitude above mean sea level for this reservation area ranges from 741 to 1,356 ft.

ORGDP is situated on a level 640-acre tract of land approximately 750-800 ft above mean sea level which is bounded on the north by Blair Road, on the west by the Clinch River, and on the south and east by Tennessee Highway 58. Poplar Creek flows from northeast to southwest through approximately the center of the plant area.

Figure 2 is a topographic map of ORGDP.

## GEOLOGY

The geological material responsible for the creation of the topographical features of the Oak Ridge area is composed of highly deformed, but unmetamorphosed, sedimentary rocks. Limestone, dolomites, and calcareous shales are the most important constituents of these geological strata, but arenaceous and argillaceous shales and sands are also very common. The soils of the Oak Ridge area are relatively infertile and ill-suited to agriculture.

The soils of ORGDP principally originate from Conosauga shale and Chickamauga limestone. These soils play a major role in the hydrological environment of ORGDP. Chemically, the soils in the Oak Ridge area are acid (pH, 4.5 to 5.7) and are strongly leached of exchangeable cations. Given a constant rate of precipitation and vegetation, the initial rate and direction of vertical movement of water and ions is largely determined by the relative pore space and clay content. The surface layers of Oak Ridge soils are typically very permeable and well drained.

The Oak Ridge Reservation lies in Seismic Zone 2, which is an area of moderate activity. A shock of major focus is not likely to occur in the Oak Ridge area during the next several thousand years. Consequently, earthquake forces generally have not been considered in the design of the ORGDP facilities.

## HYDROLOGY

All waters drained from the Oak Ridge Reservation eventually reach the Tennessee-Ohio-Mississippi water system via the Clinch River. The major stream of ORGDP is Poplar Creek which flows roughly through the center of the facility and drains into the Clinch River at mile 12.0. Poplar Creek, which drains the Cumberland Mountains to the northwest, and the East Fork of Poplar Creek, which drains the City of Oak Ridge and the Y-12 Plant, converge at a point approximately 1.5 mi above ORGDP. The total drainage area for both streams is about 102 mi<sup>2</sup>, and the average discharge is about 216 cfs. The extremes range from a maximum of approximately 10,000 cfs to a minimum of approximately 25 cfs.

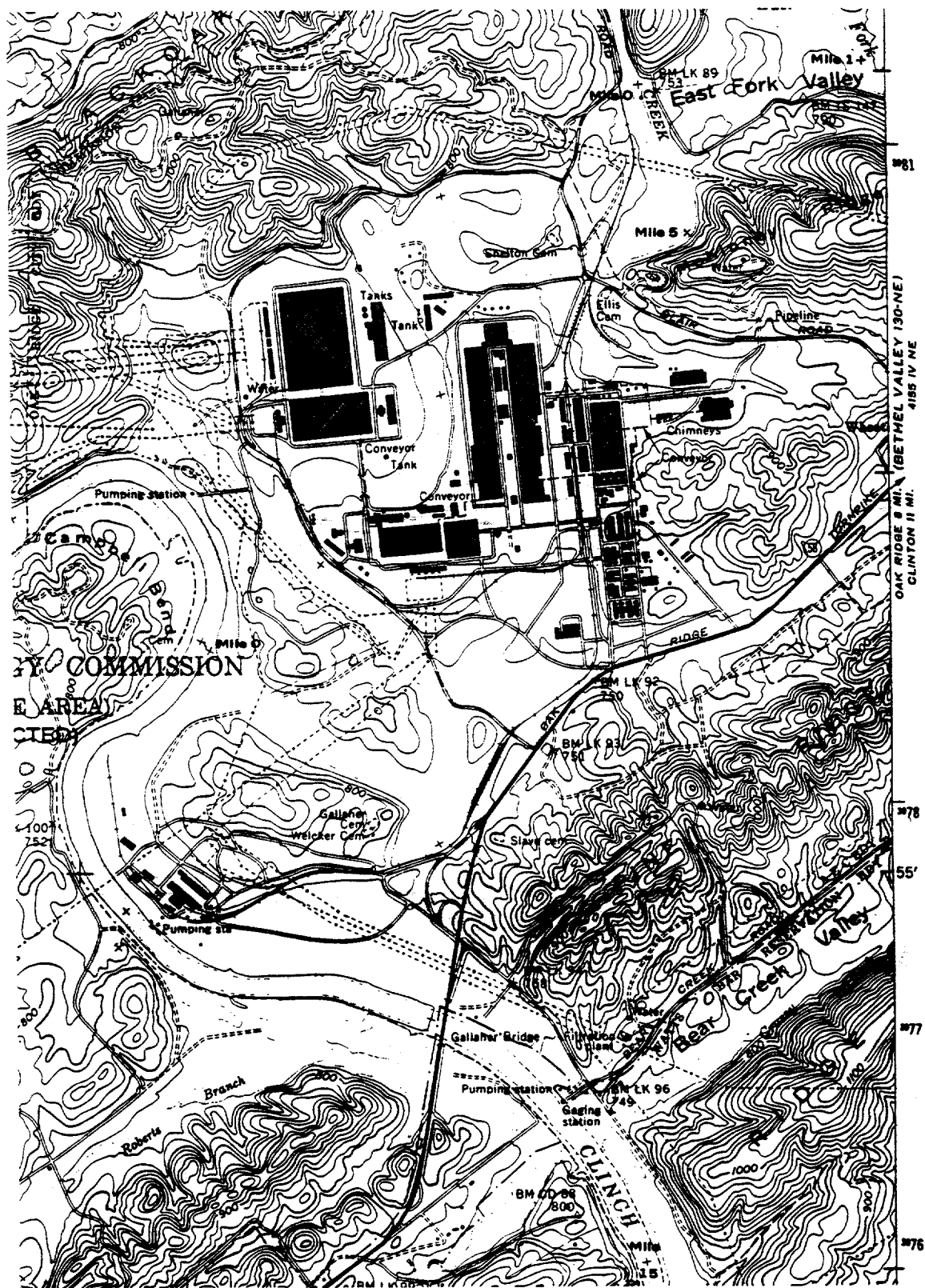


Figure 2  
TOPOGRAPHIC MAP OF ORGDP

In general, the waters of the stream are of the calcium-magnesium bicarbonate type. These ions impart the alkalinity and hardness characteristic of streams in this region. The hardness averages about 105 ppm, with an alkalinity of about 85 ppm.

The burial sites, which are all above the 775-ft elevation level, are not subject to flooding. The contaminated scrap metal yard, located adjacent to the Clinch River, could be affected by 100-yr flood conditions.

Groundwater conditions basically follow water-table conditions. Hence, water movement parallels topographic contours and generally flows in a northeast-to-southwest direction. Most of the groundwater in the area travels through unconsolidated soil. Groundwater in bedrock is largely confined to fractures of limestone strata enlarged by dissolution. No major groundwater resources have been developed in the area because the geologic formations are too impenetrable to retain a significant amount of groundwater.

#### CLIMATOLOGY

Heavy precipitation occurs in both winter and summer months; comparatively, spring and autumn are dry. Average annual precipitation is between 50 and 60 in. Monthly average temperatures are in the moderate range (40 to 80°F). Temperature extremes of >100°F and <0°F are rare. The wind direction pattern reflects the topographic orientation of the Valley and Ridge Province that consists of prevailing up-valley (southwest and west-southwest) and down-valley (northeast and east-northeast) flow.

#### ECOLOGY

Because of the proximity of the Oak Ridge area to the Cumberland Mountains, the dominant oak-hickory association is strongly related to the mixed mesophytic associations of more moist cove and slope forests. The oak-hickory association shares equal prominence with the yellow pine-hardwood type, second-growth, yellow-poplar dominated bottomland and lower slope associations are widespread. Riparian vegetation is primarily willow, sycamore, and maple. Large areas of abandoned cropland were planted with loblolly pine. A variety of herbaceous species make up the ground cover with honeysuckle, poison ivy, and greenbriar dominating.

The variety of wooded and open areas, as well as extensive edge communities, create favorable habitats for a wide variety of bird species. Mammalian fauna composition of the area tends to correlate with vegetation type. Small mammals, such as rodents, may be confined to a single habitat, while larger species may range over several habitats.

The relatively uniform water environment tends to produce somewhat permanent communities of plants and associated animals. Densities of periphyton and phytoplankton follow an annual cycle typical for the temperature climate. Microinvertebrates, insects, and crayfish are widely distributed. High populations of rough, forage, and game fish are found in the Clinch River. However, all animal populations have much lower levels in Poplar Creek.

## DESCRIPTION OF FACILITIES

## OLD CLASSIFIED BURIAL GROUND

The Old Classified Burial Ground, located approximately 400 ft north of Building K-1401 and about 400 ft west of the K-1407-B holding pond (Figure 1), covers about 3.7 acres and has an average depth of about 30 ft. It contains classified wastes, both radioactive and nonradioactive. Due to the lack of accurate records, however, no good estimate of the radioactivity of these materials can be made. It can be inferred that most of the material buried in this burial ground is uranium contaminated with only trace quantities of transuranics and/or fission products.

The burial ground was formed by the filling of a large swampy area that drained into a small branch creek which, in turn, emptied into Poplar Creek.

Although the underlying rock (cherty dolomite) could allow for significant seepage, the majority of the drainage from the burial ground appears to flow to the small branch. Thus, any significant leaching of soluble materials buried here should be detected through analyses of samples taken from the branch creek. Such undocumented analyses have indicated no leaching.

Adjacent to the burial ground is Building K-1302 and the fire drill station. No utilities are located in the immediate area.

Figure 3 is a photograph of the Old Classified Burial Ground facing north.

## NEW CLASSIFIED BURIAL GROUND

The New Classified Burial Ground, which is presently in use, was built in 1975 to accommodate classified low-level radioactive and nonradioactive contaminated waste. It was initially only a small area (1 to 2 acres) but was expanded in 1976 to 22 acres located between Buildings K-1037 and K-1200 (Figure 1). Waste material is buried in trenches 15 ft deep and 100 ft long. Each trench is completely filled and covered with dirt and grass seeded before excavating a new trench.

The subsurface of this site consists of clay, siltstone, shale, and thin layers of limestone. Surface drainage from the area is to the K-1007-B holding pond and to Poplar Creek via NPDES Discharge Location 1.

At the present time, only 0.1 curies of uranium is buried at this site, with trace quantities of transuranics and/or fission products.

Figure 4 shows the full part of the burial ground where maintenance equipment is stored. Figure 5 shows the unused part of the burial ground.

## K-33 CONTAMINATED WASTE BURIAL GROUND

The K-33 Contaminated Waste Burial Ground is a small area located northwest of Building K-33 utilized for the disposal of unclassified low-level solid radioactive waste. This site was opened during the late 1940's.

PHOTO NO. PH-77-1556  
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Figure 3  
OLD CLASSIFIED BURIAL GROUND FACING NORTH

PHOTO NO. PH-77-1552  
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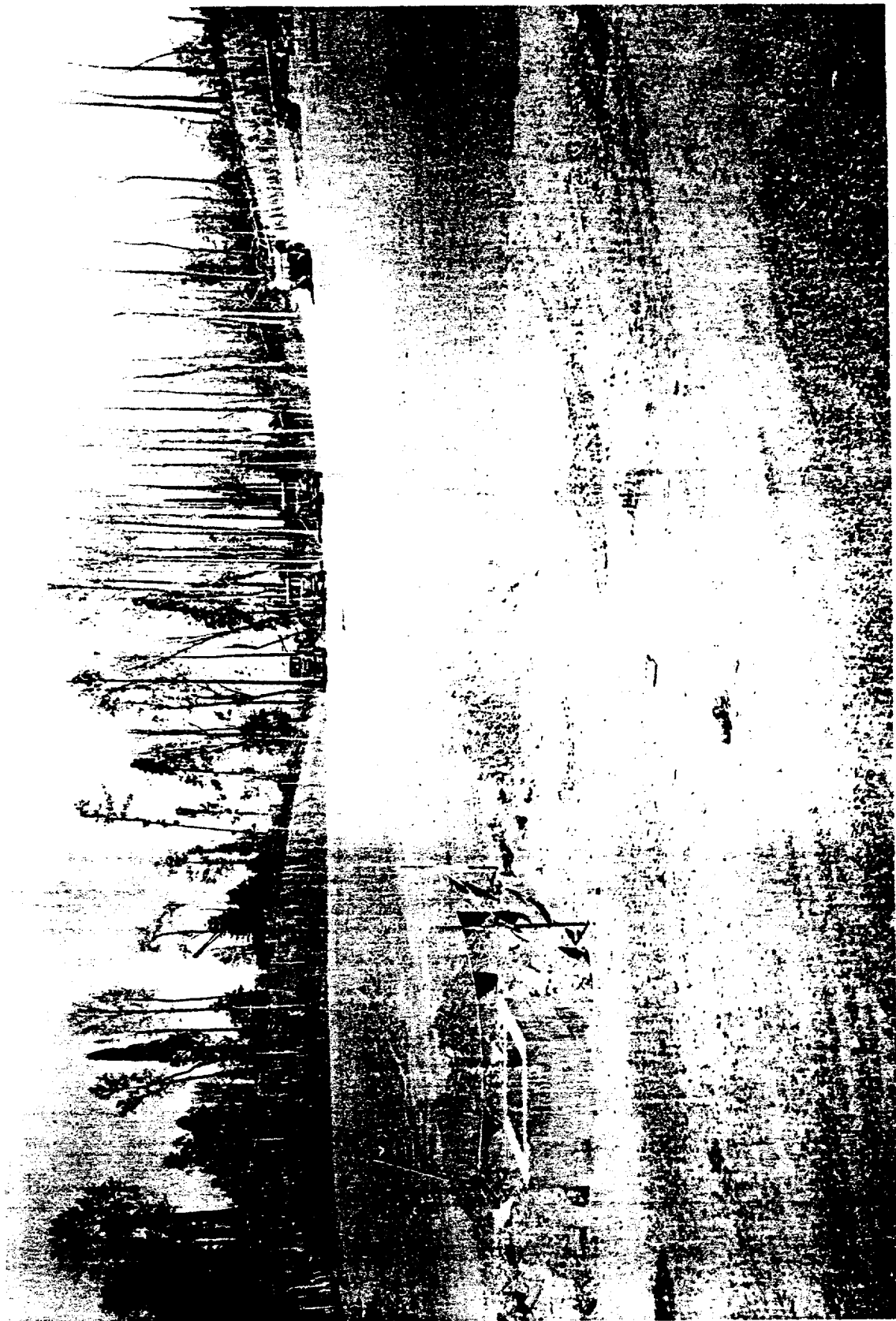


Figure 4

NEW CLASSIFIED BURIAL GROUND FACING EAST  
THIS AREA IS NOW FULL AND IS USED FOR MAINTENANCE EQUIPMENT STORAGE

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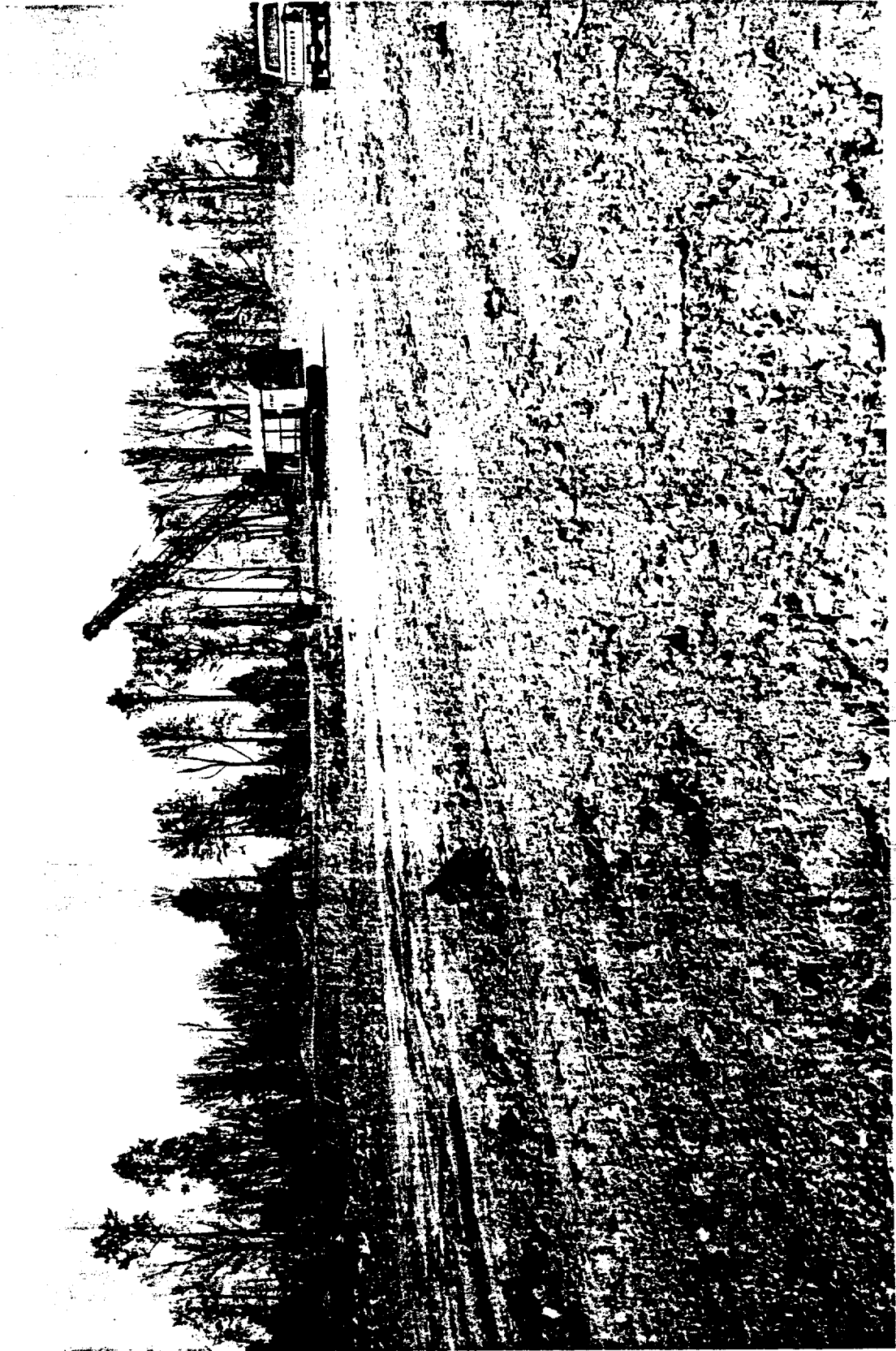


Figure 5

UNUSED AREA OF THE NEW CLASSIFIED BURIAL GROUND FACING NORTHWEST

While the total area committed for this type of disposal is approximately 2.6 acres, the area actually occupied by the buried materials is less than 0.2 acre. As of July 1, 1975, this area contained about 35,575 ft<sup>3</sup> of materials contaminated with uranium and 2,430 ft<sup>3</sup> of materials contaminated with thorium. The bulk of the material is leached alumina containing small quantities of uranium that were generated as a waste stream from the Uranium Scrap Treatment Facility. Small amounts of other uranium compounds, thorium compounds, contaminated UF<sub>6</sub> cylinders, beryllium chips, boron, contaminated NaF, MFL oil, rags, etc., are also buried at this location. The total radioactivity of these materials is predicted to be approximately 14.1 curies.

Accurate up-to-date records of the materials contained in this burial ground were maintained by marking each grave with a numbered stake and recording the contents corresponding to the stake. The area contains 62 graves of various sizes, ranging from trenches 11 ft deep x 3 ft wide x 108 ft long to augered holes 12 ft deep x 3 ft diameter. Figure 6 shows the burial ground with its numbered graves and trenches. While the area is not enclosed by a security fence, a gate across the road leading to the area bars unintentional access by persons in vehicles. There are no utilities associated with this site. Monitoring of the contaminated burial ground, which is achieved through the sampling of four shallow test wells located around the site, indicated that leaching of radioactivity is negligible. However, since the underlying rock is cherty dolomite, such leaching possibly would not be collected by the test wells. Thus, the sample analyses do not conclusively prove that leaching does not occur.

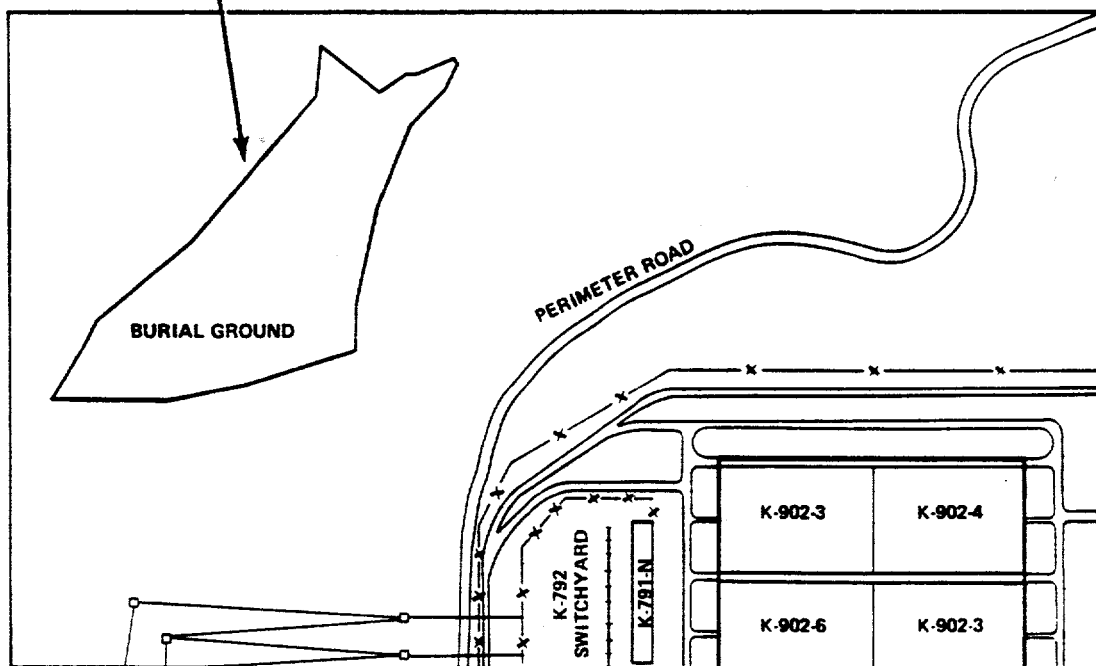
The use of the K-33 Contaminated Waste Burial Ground was discontinued effective March 1976. Figure 7 is a photograph of the burial ground area showing marked graves and trenches.

#### K-722 SCRAP METAL YARD

The K-722 Scrap Metal Yard contains approximately 20 acres of land for the storage of scrap metal. This scrap metal consists of unclassified property or nonproperty items that are deemed to have no further life or usefulness in their present state, but may have monetary value because of metallic content. The scrap metals consist of steel, stainless steel, aluminum, copper, nickel, or alloys. Five acres are set aside for the storage of low-level uranium contaminated scrap metal. Contaminated scrap is metal which has been exposed to uranium materials or shows alpha or beta-gamma activity on the surface. In addition, clean or uncontaminated scrap metal which is known not to have been exposed to uranium materials is stored in this yard, but separate from the contaminated scrap.

It is estimated that from 3,000 to 5,000 tons of low-level uranium contaminated scrap metal are stored in the 5 acres. No estimate of the quantity of radionuclides contained by these materials is available.

Figure 8 shows the powerhouse area with the uncontaminated and contaminated scrap metal yards. All types of utilities are found in the powerhouse area, but not immediately in the scrap metal yards.



**Figure 6**  
**PLOT PLAN OF K-33 CONTAMINATED WASTE BURIAL GROUND**

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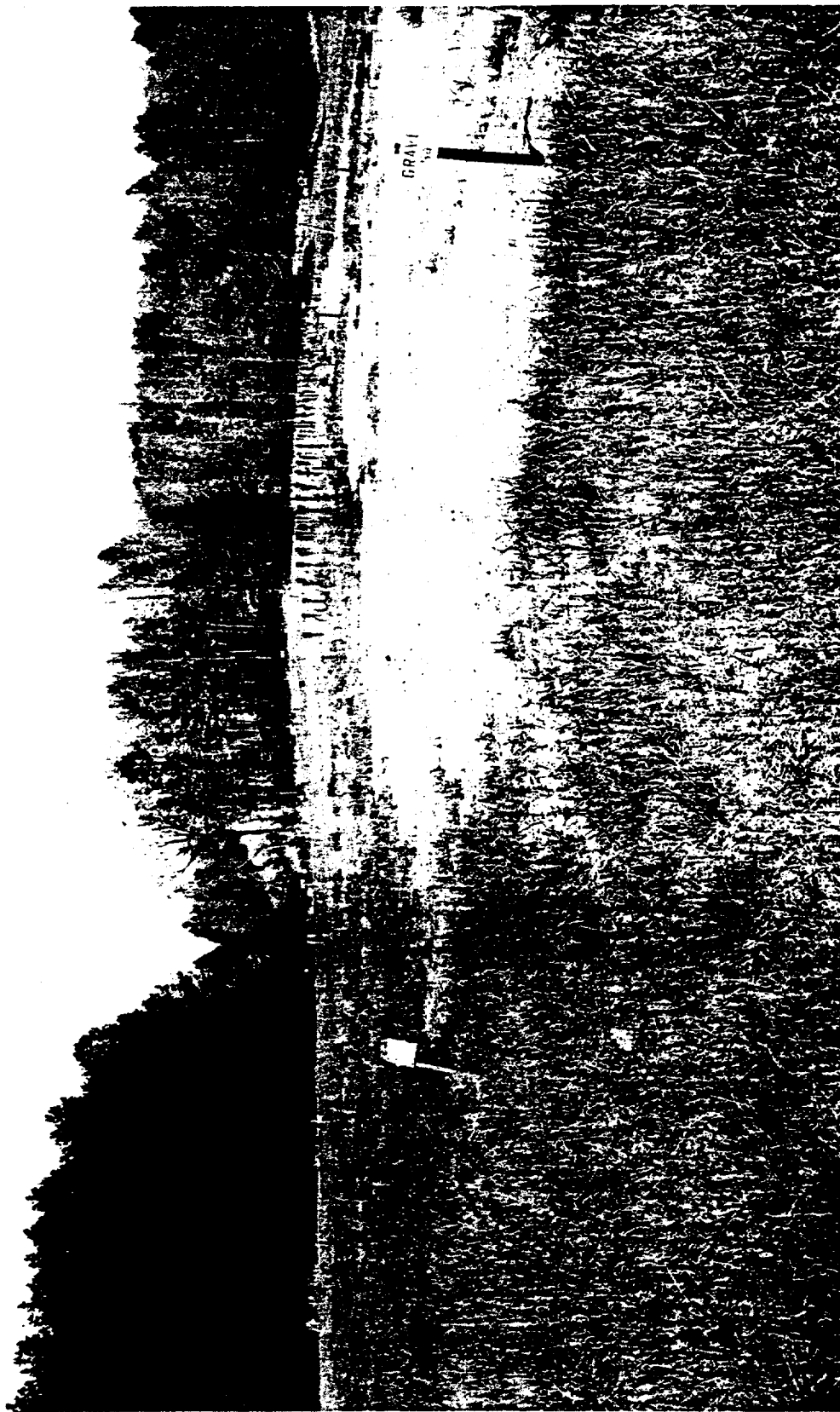


Figure 7  
K-33 CONTAMINATED WASTE BURIAL GROUND FACING NORTH

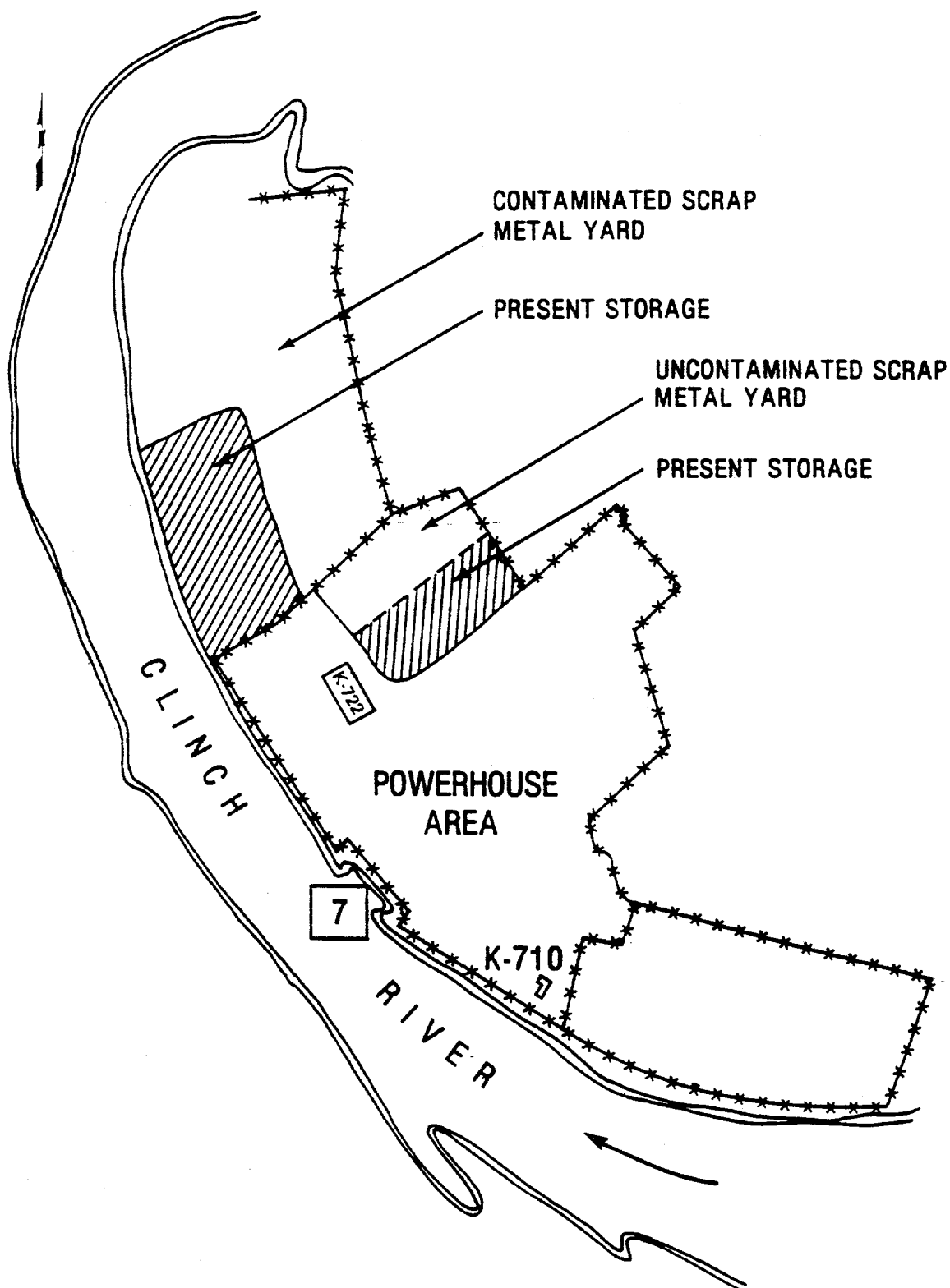


Figure 8  
PLOT PLAN OF ORGDP SCRAP METAL YARDS

The underlying rock structure of the scrap metal yard is Chickamauga limestone. Since the contaminated yard is very close to the Clinch River, any leaching of soluble uranium compounds should flow to the river. Undocumented analyses of samples taken at the two Clinch River sample stations have indicated no leaching.

Figure 9 is a photograph of the clean or uncontaminated scrap metal yard. Figure 10 shows the contaminated scrap metal yard. Substantial amounts of clean and contaminated metals will be generated by the Cascade Improvement Program/Cascade Upgrading Program (CIP/CUP). At present, studies are being evaluated technically and economically for the ultimate disposal of these stored metals.

#### K-1407-C RETENTION BASIN

The K-1407-C Retention Basin, located about 400 ft north of the K-1407-B holding pond, inside the plant security fence, is approximately 700 ft long, 50 ft wide, and 6 ft deep. As can be seen from Figure 1, the basin is bounded on the east, north, and west by a gravel access road. To the south, it has the Northeast Patrol Road and across the Patrol Road lies the K-1407-B holding pond. The primary purpose of the retention basin is the disposal of radioactive and nonradioactive sludge wastes, such as dredgings removed from the various holding ponds and from small neutralization-precipitation operations.

The K-1407-C basin, constructed in February 1973, contains about 1,500 yd<sup>3</sup> of dewatered sludge, primarily consisting of low-assay uranium and other metallic oxides. The sludge of the K-1407-B holding pond was removed from the bottom sediments by the use of a mudcat. This is a type of floating device shown in Figure 11 equipped with a vacuum pump and a bottom sediment turbulator. The turbulator agitated the sediments and a vacuum line pumped the sludge into the K-1407-C Retention Basin. A return line brought the water back into the K-1407-B holding pond.

The total radioactivity of the material contained in this basin is estimated to be about 18 curies, consisting primarily of uranium compounds and technetium-99.

The use of this pond is currently limited to the periodic storage of lime softening sludges. Radioactive wastes are not routinely deposited in this basin. While surface water monitoring has not revealed leached material from the K-1407-C basin, no subsurface samples have been collected. However, accumulated undocumented data have revealed that the rate of seepage out of the basin is so small that any leaching of the materials into underground streams should be negligible.

Figure 12 is a photograph showing the present state of the K-1407-C Retention Basin.

In addition to the retention basin, ORGDP has three holding ponds that provide for settling of solids from, and pH control of, a large portion of its liquid effluents. A brief description of each of these ponds is as follows:

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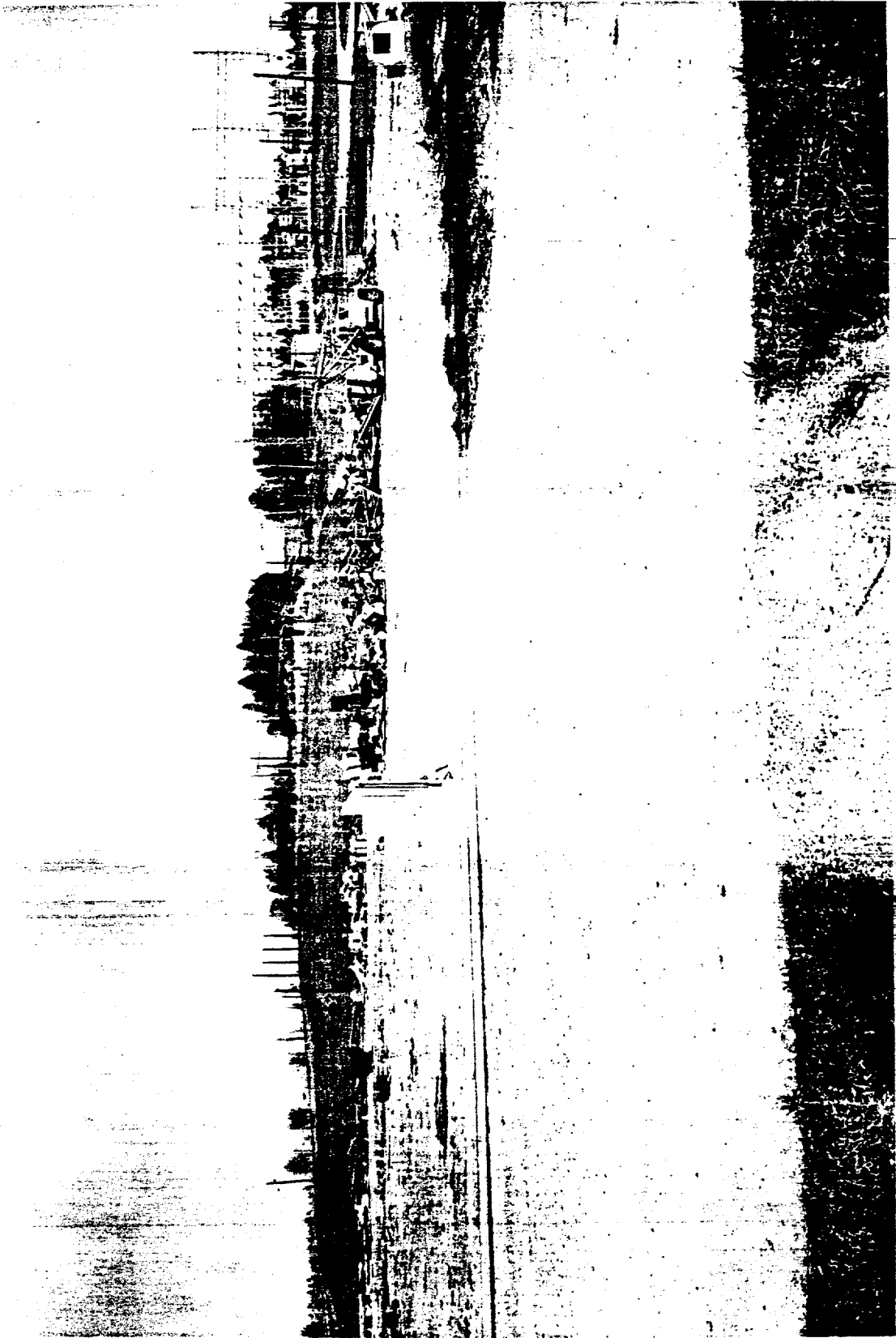


Figure 9  
K-722 CLEAN SCRAP METAL YARD

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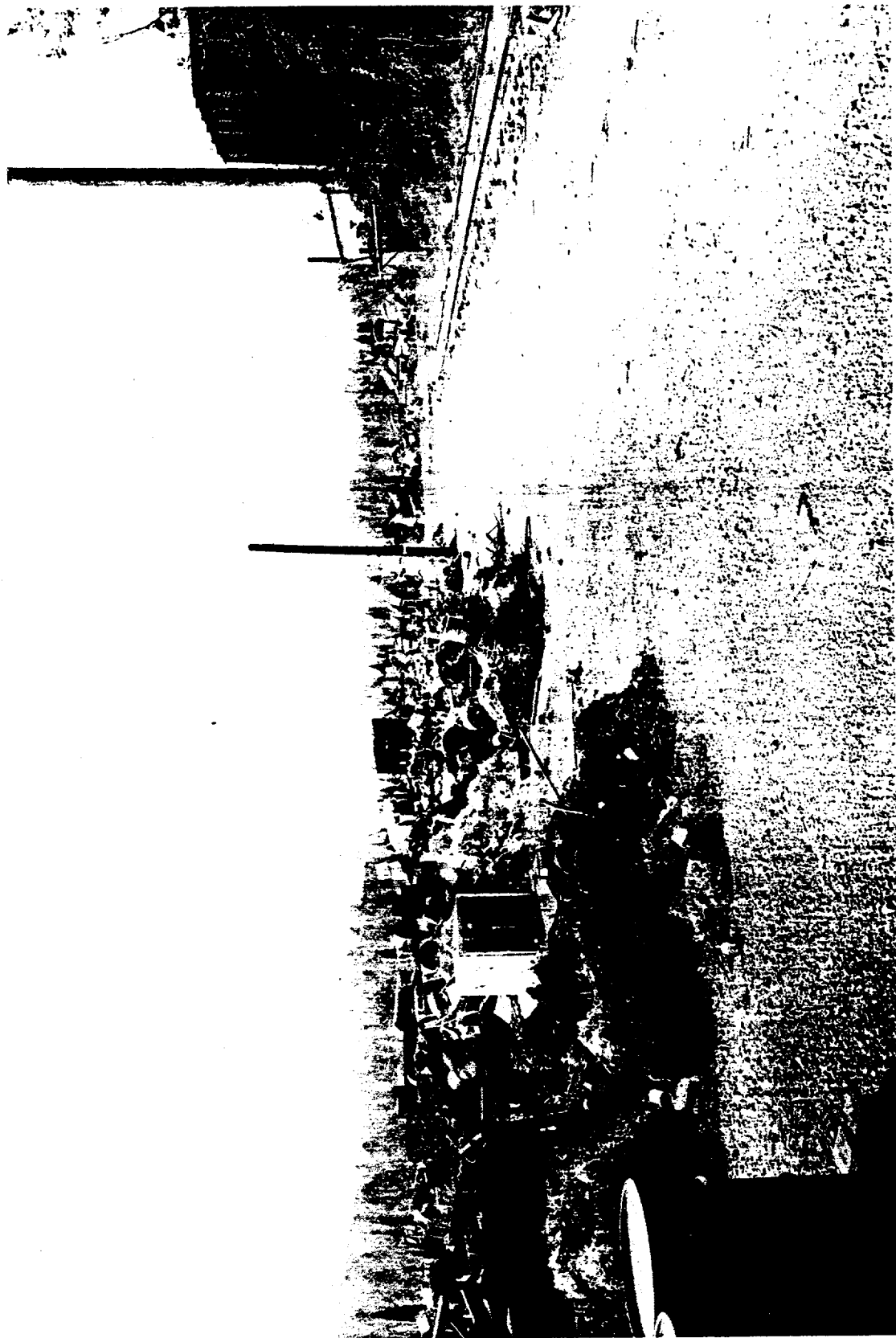


Figure 10  
K-722 CONTAMINATED SCRAP METAL YARD

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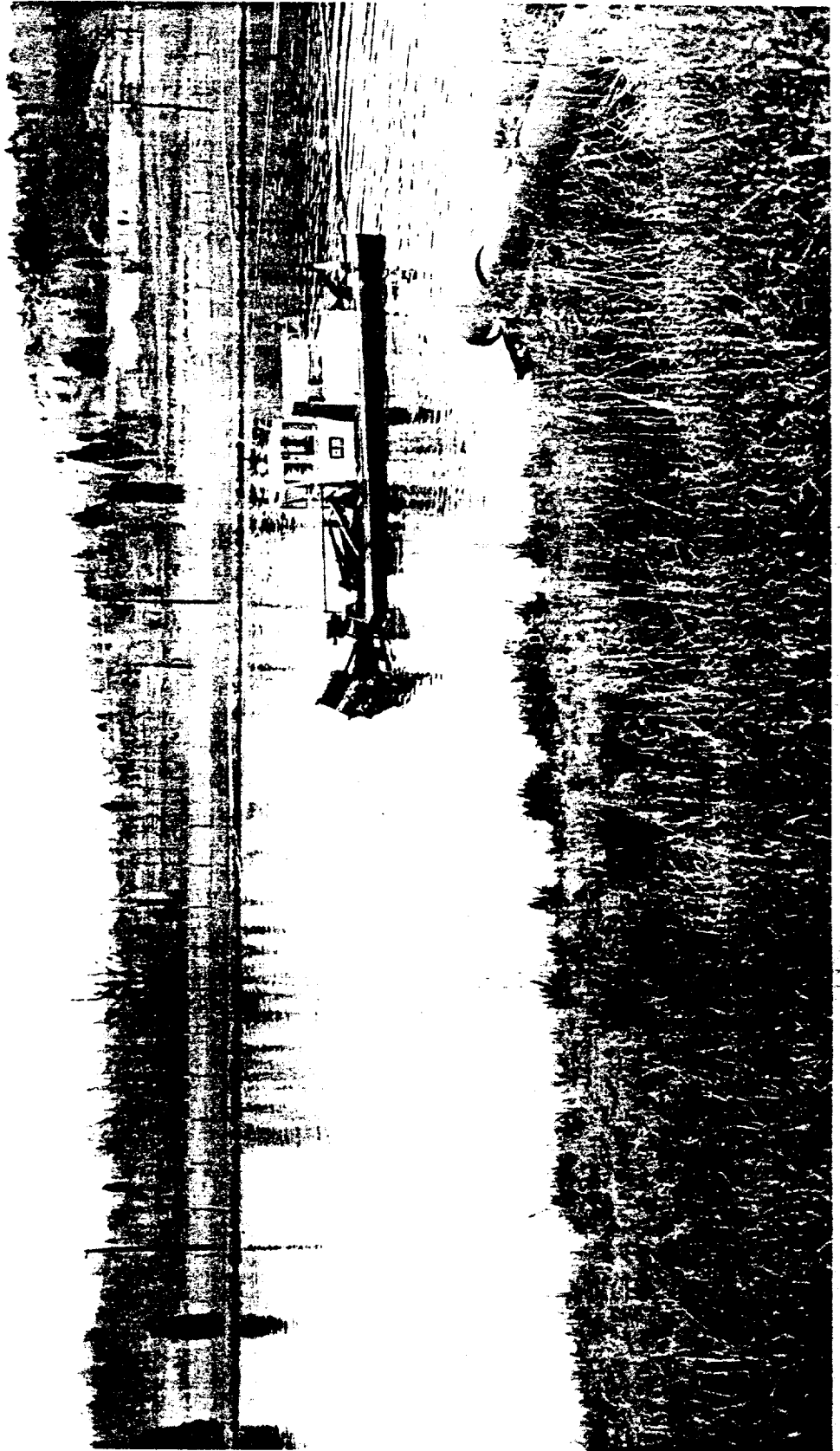


Figure 11  
MUDCAT AT THE K-1407-C RETENTION BASIN

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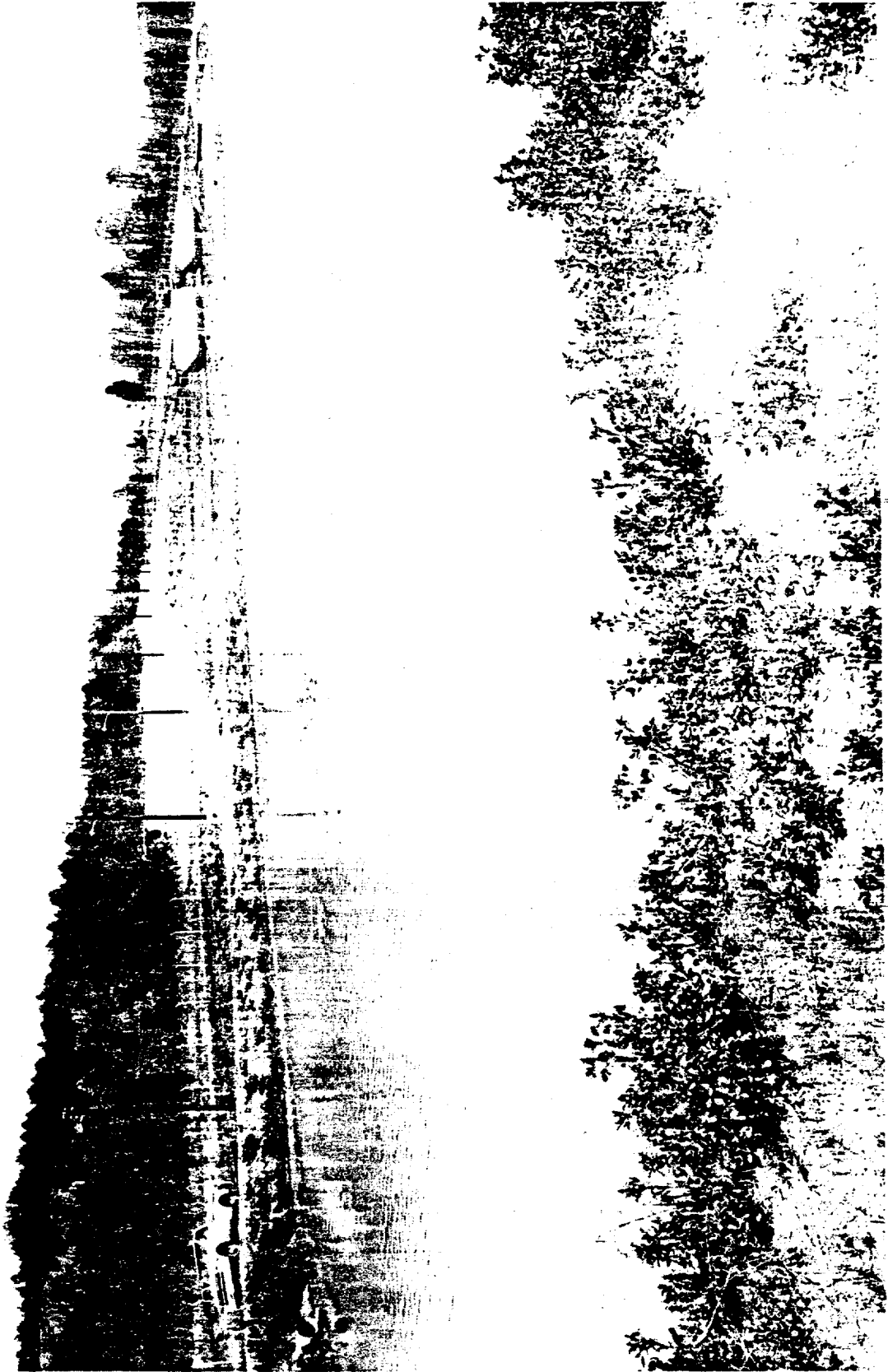


Figure 12  
K-1407-C RETENTION BASIN

### K-1407-B Holding Pond

The K-1407-B holding pond, located in the northeast region of the plant site, just west of the K-1420 facility (Figure 1), is approximately 390 ft long, 150 ft wide, and 6 ft deep. While the primary purpose is the settling of uranium compounds discharged from the decontamination and recovery facility (Building K-1420), the pond also receives nitrate, acidic, and caustic wastes from Building K-1420, caustic wastes from the steam plant water treatment process, neutralized wastes from the K-1401 metals preparation facility, and blowdown from the barrier manufacturing facility's recirculating water system. Approximately 3 curies of radioactivity, consisting primarily of low-assay uranium and technetium compounds are predicted to be contained by the pond at this time (April 1977).

### K-901-A Holding Pond

The K-901-A holding pond, located about 1,500 ft west of the K-31 Diffusion Process Building, is approximately 1,400 ft long; its width ranges from a few feet to nearly 450 ft, and its depth ranges from a few inches to about 10 ft. While its primary purpose is the settling of lime softening solids (primarily calcium and magnesium hydroxide) discharged from the recirculating water system makeup treatment facility, it also receives the liquid blowdown (containing chromates, phosphates, and zinc) from the recirculating water system and the effluents from several storm drains. In addition, the pond was used in the past as the receiving medium for both radioactive and nonradioactive wastes released from an intermittent cylinder-puncturing operation. In this operation, old cylinders containing various chemical wastes were punctured and immediately dropped into the pond to reduce the quantity of gaseous releases to the atmosphere. After the pressure in the cylinder had been equalized, the cylinders were removed from the water. No estimate of the radioactivity contained within this pond is available, although some uranium and trace quantities of technetium-99 have been detected.

### K-1007-B Holding Pond

The K-1007-B holding pond, which borders the front south side of the plant, is about 1,800 ft in length, 450 ft in width, and 5 ft in depth. Its primary functions are the pH control, through dilution, of the small quantities of acidic and caustic wastes discharged from the various laboratories in the plant and the settling of solids (primarily calcium hydroxide) received from chemical processing operations and storm drain effluents. No estimate of the quantity of radioactive materials present in this pond is available. However, bottom sediment samples have been determined to contain trace concentrations of uranium and technetium compounds.

## OPERATING PRACTICES

### OLD CLASSIFIED BURIAL GROUND

Since the Old Classified Burial Ground is no longer used for waste disposal, there are no operating practices currently associated with its use. Most of the material buried at this site was picked up by dump trucks in different plant locations by the Maintenance Division and brought to the area for disposal.

## NEW CLASSIFIED BURIAL GROUND

In the last 2 years, the operating practices associated with the New Classified Burial Ground have been well documented. The recently implemented Solid Waste Information Management System (SWIMS) will serve to maintain a current inventory of radioactive disposal activity at this site.

The operating procedure, SPP-341, *Classified Scrap Control Program*, requires that the department generating the classified waste (either contaminated or noncontaminated) initiate Form UCN-1159, *Request for Salvage Services*. It is then their responsibility to contact the ORGDP Health Physics for a radiation survey of the waste. Health Physics denotes the radiation survey readings and the uranium mass content estimate of the material to be buried on both the UCN-1159 form and on the accompanying radiation tag. The Maintenance Division is then contacted to pick up the material for disposal. The Maintenance Division also maintains an up-to-date record on burial locations for specific radioactive items.

## K-33 CONTAMINATED WASTE BURIAL GROUND

Since the K-33 Contaminated Waste Burial Ground is no longer used for waste disposal, there are no operating practices associated with its use, except for routine landscaping maintenance. Such maintenance of the burial ground is done by filling in with dirt at the required places and grass seeding to prevent erosion. Vegetation control is also accomplished to prevent uptake of an isotope by the root system of plants and the subsequent spread of contamination up the biological food chain.

## K-722 SCRAP METAL YARD

The K-722 Scrap Metal Yard activities follow SPP-340, *Scrap Metal Control Program*. Generally, the procedure specifies that the department generating the scrap metal contacts the ORGDP Health Physics for a radiation survey of the scrap metal. Health Physics tags the load either clean or contaminated, and the scrap metal is then picked up by the Maintenance Division for transportation to the scrap metal yard. The scrap metal is unloaded for storage in a designated area according to its contamination classification labeled by Health Physics.

## K-1407-C RETENTION BASIN

The current use of the K-1407-C Retention Basin is restricted to radioactive and nonradioactive sludge disposal and is controlled by the ORGDP Environmental Management Group. Requests and approvals for use are limited to a case-by-case basis to prevent unacceptable materials from entering the basin. A diversion ditch is maintained on the uphill (north) side of the area to prevent surface runoff from increasing the liquid level in the basin. Other maintenance requirements of this area include seeding and mowing of grass, and maintenance of access roads.

## CONCLUSIONS

The ORGDP management program for low-level radioactive solid waste for the five sites described is operating satisfactorily. Routine standard stream monitoring data indicate no significant leaching of radioactive material from any of the sites. However, it is noted that an improved monitoring program associated with proper design and located test wells will give more pertinent information on the leaching characteristics, if any, of each of the sites.

The ORGDP scrap metal storage is pending investigation and evaluation of several technical ways for the ultimate disposal of these metals.

## RECOMMENDATIONS

The following recommendations for each site are proposed as a means for improving the management and monitoring of the ORGDP low-level solid radioactive waste disposal and storage areas:

## OLD CLASSIFIED BURIAL GROUND

1. To minimize the potential of leakage by water percolation, consideration should be given to stabilizing the surface of this site. For example, it could be paved and used for UF<sub>6</sub> cylinder storage.
2. The leaching characteristics of this site should be determined and documented.

## NEW CLASSIFIED BURIAL GROUND

1. A minimum of six subsurface test wells should be established in this burial ground. General Plant Project (GPP) funds have been allocated to locate some test wells around this site. The need for additional funding should be evaluated.
2. Burnable, unclassified nonradioactive industrial trash should not be buried in this area. Continuation of this practice will diminish the available space of the burial ground for its proper use.

## K-33 CONTAMINATED WASTE BURIAL GROUND

1. Due to the poor geological structure of the substrate of this site, a study was conducted to determine the feasibility, cost, and method of relocating the material contents of this site to the Y-12 Plant. It was concluded that the potential benefits obtained from this operation could not be justified by the economic cost involved. Therefore, in addition to the four existing shallow test wells, it is recommended that approximately four deep test wells should be located at strategic sites around the immediate area of the burial ground. In the initial radioanalysis for each test well, a fairly complete evaluation should be made for many radionuclides, as well as analysis for nitrates and fluorides.
2. Existing monitoring data should be documented.

## K-722 SCRAP METAL YARD

1. Studies of alternate methods of ultimate disposal of the scrap metals should be continued to develop a long-range scrap management plan.

## K-1407-C RETENTION BASIN

1. A study should be initiated to evaluate the long-term disposal of the sludge of this basin and other radioactive sludges generated by processes at ORGDP.
2. To provide pertinent data on the subsurface leaching characteristics of this basin, a test well should be drilled southwest of the basin. An additional well should also be drilled north of the basin to establish background radioactivity levels.
3. An estimate of the amount of radioactive materials in the K-901-A and K-1007-B holding pond should be prepared.
4. Accumulated monitoring data on this site should be documented.

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Project Management Corporation, et. al., *Final Environmental Statement Related to Construction and Operation of Clinch River Breeder Reactor Plant*, February 1977, Docket No. 50-537, NUREG - 0139.

## ACKNOWLEDGMENTS

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